ENERGY PROGRAM AT ROCK ISLAND ARSENAL

RIA ENERGY PLAN, October, 2004

PUBLIC WORKS
Phone:309-782-2121
Email:AMSTA-RI-PW@ria.army.mil

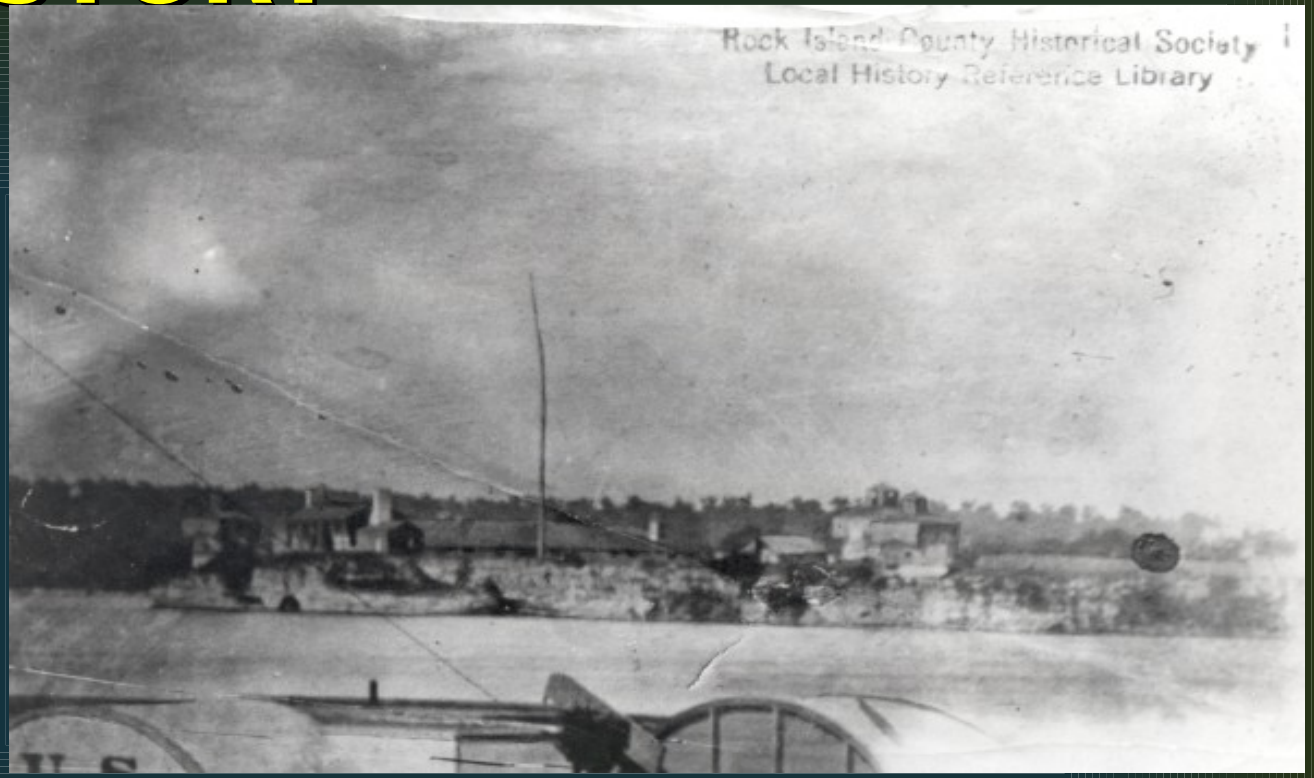
ROCK ISLAND ARSENAL

- **200 BUILDINGS**
- **6.5 MILLION SQ FT**

BRIEFING OUTLIN

- ARSENAL ISLAND HISTORY
- ENERGY PLAN GOALS, PROGRESS, OBJECTIVES
- ENERGY PROGRAM SUCCESSES
- PROJECT OPPORTUNITIES
- WATER CONSERVATION PLAN
- ENERGY AWARENESS PLAN

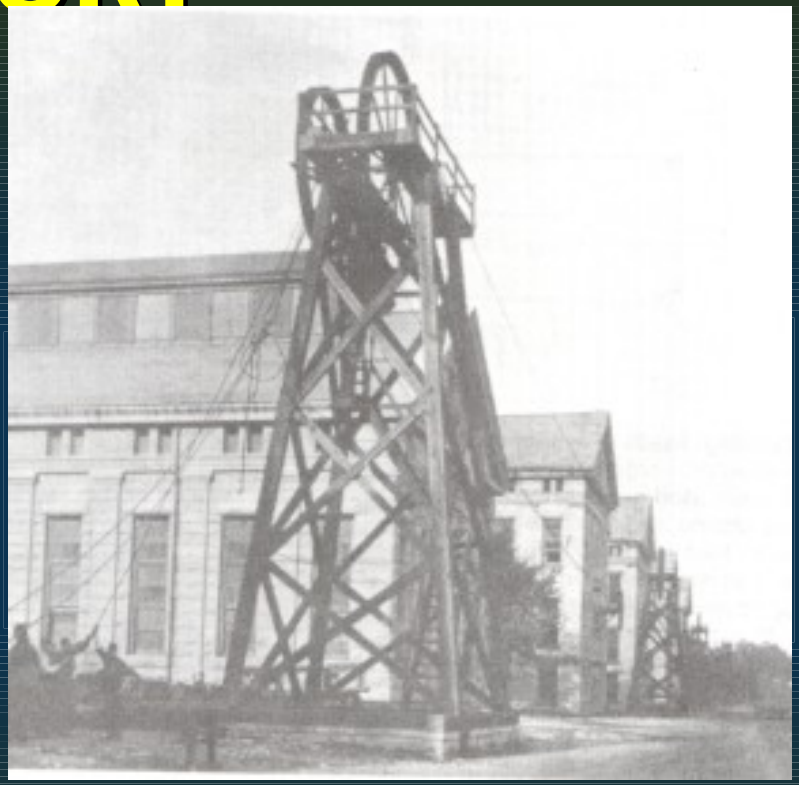
ARSENAL ISLAND HISTORY



- Ft Armstrong occupied island from 1812 –18
- The Arsenal was established in July 1862
- Being a National Historic Landmark has a gr

impact on energy conservation measures

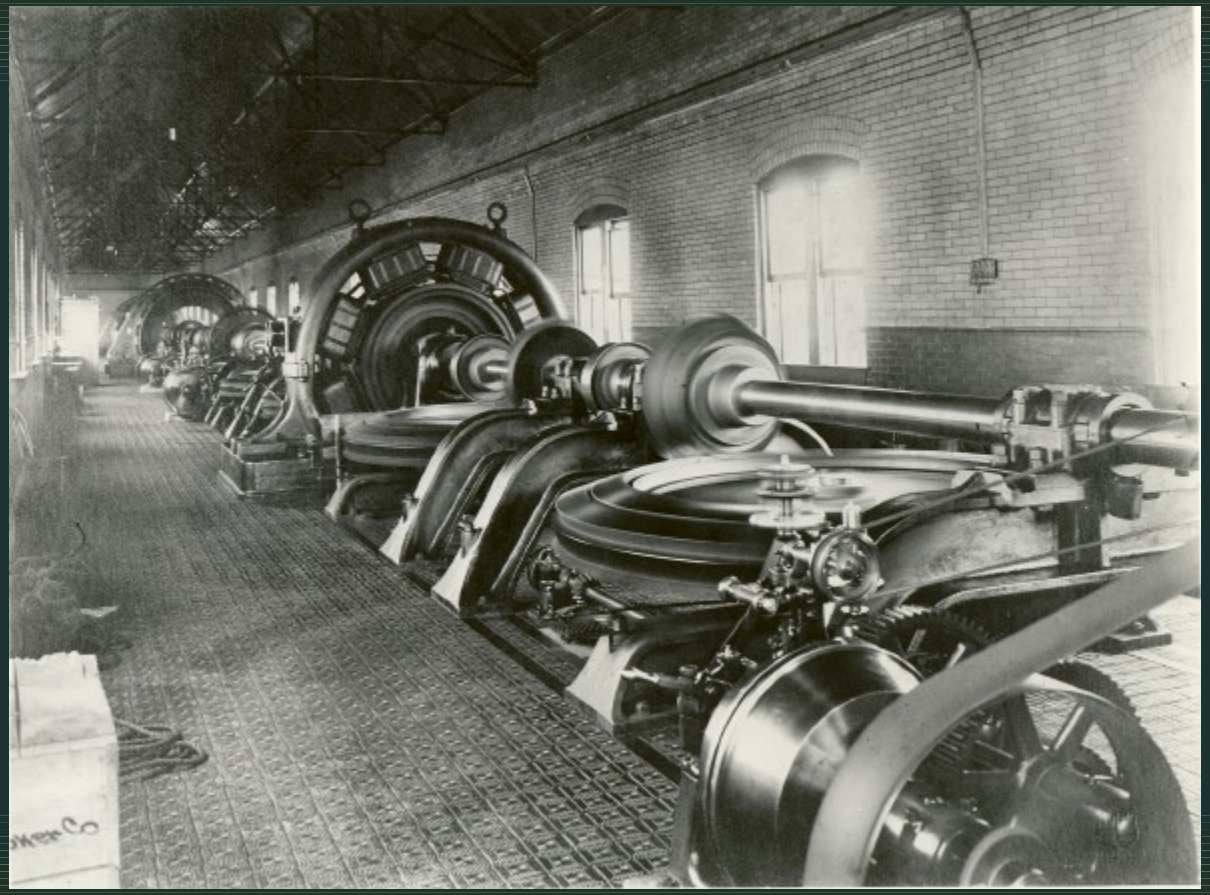
ARSENAL ISLAND HISTORY



- Our first power conveyance was through a Telodynamic Hydro Power system, 1879

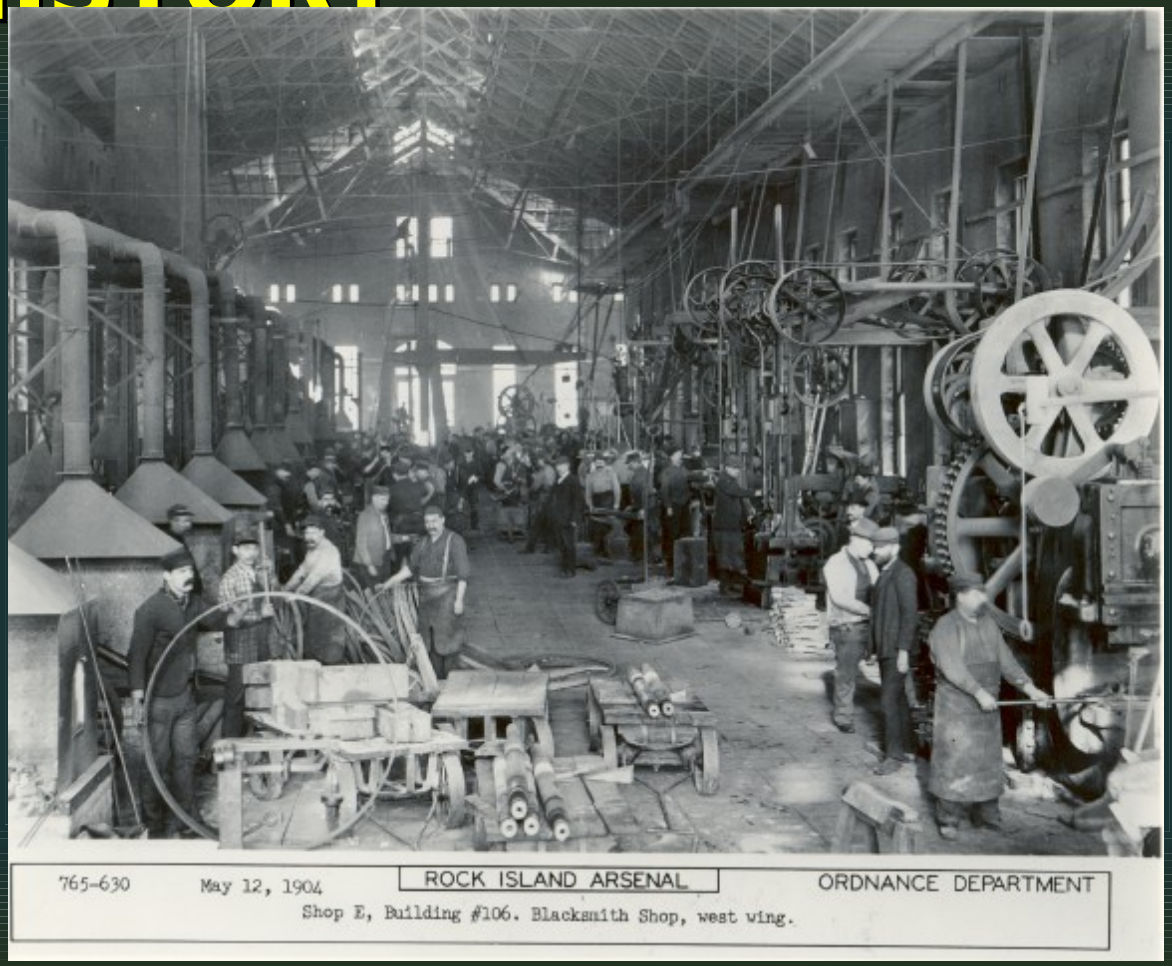
- Approximately 500 HP was delivered throu this wire-cable system to the stone shops

ARSENAL ISLAND HISTORY



- 1st Hydro-electric Conversion, circa 1900

ARSENAL ISLAND HISTORY



- **Blacksmith Shop, 1904**

Here's where early electricity was used!

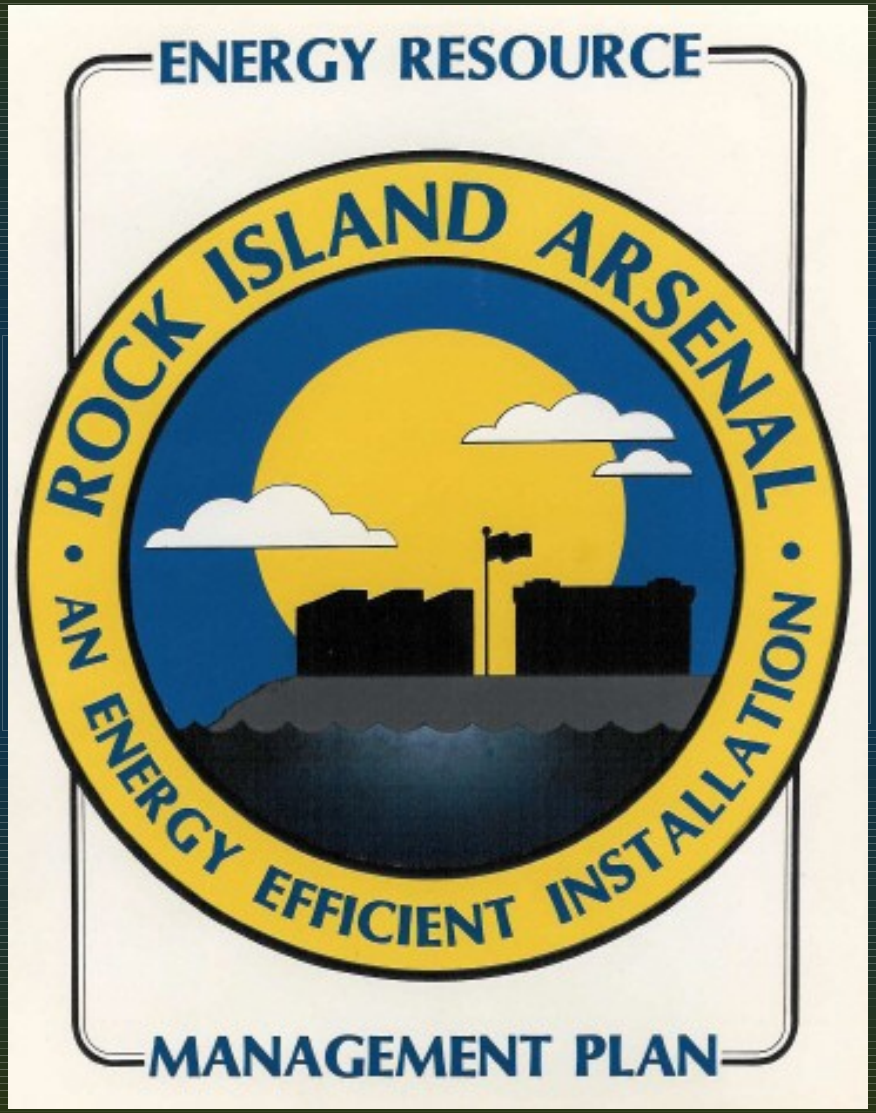
ARSENAL ISLAND HISTORY

- The Arsenal's Hydro-electric Plant was first commissioned in 1919

Our Manufacturing Renovation In The Early 1990's (REARM)

-REARM Created Great Energy Saving Opportunities

RIA ENERGY PROGRAM



RIA ENERGY PROGRAM
OUTLINE OF ENERGY PLAN

- ENERGY GOALS
- PROGRESS CHART
- PRINCIPLE OBJECTIVES
- COMPLETED PROJECTS
- PROJECT OPPORTUNITIES
- WATER CONSERVATION
- AWARENESS & OUTREACH
- ENERGY PLANS & POLICIES

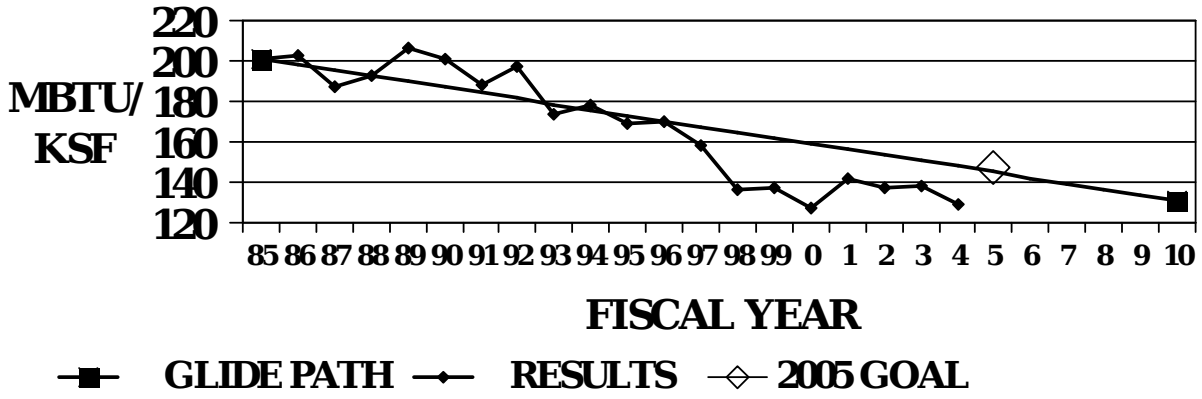
ENERGY PROGRAM PROGRESS

RIA ENERGY PROGRAM
ENERGY GOALS & STATUS

- FY 1985 BASELINE: 201 MBTU/Ksf
- FY 2010 GOAL (35%): 131 MBTU/kSF
- FY 2005 GOAL (2%): 126 MBTU/kSF
- FY 2004 RESULTS: 129 MBTU/kSF
- FY 2005 TO DATE: X.X % Decrease

RIA ENERGY PROGRAM
FY 2005 PROGRESS CHART

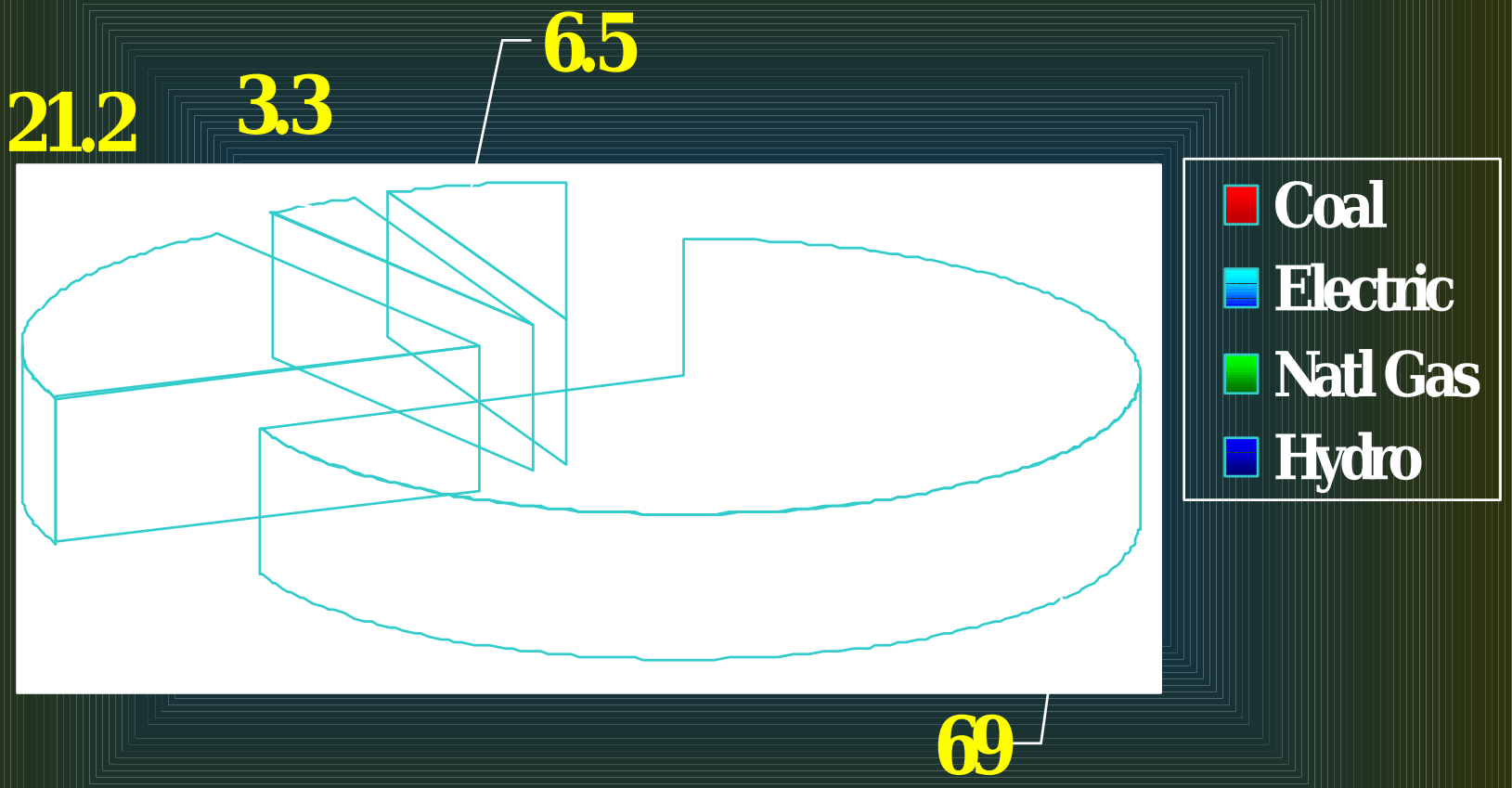
36 % REDUCTION IN TOTAL ENERGY!



We have been at or below the Energy Glide-path for a decade!

Note: RADDS Data does not allow correct coal BTU values.
This chart is correct!

RIA ENERGY PROGRAM
FY 2005 ENERGY BREAKOUT



COMPARISONS TO 1985

COAL:	28% LESS
ELECTRIC:	1% LESS
NATL GAS:	3% MORE

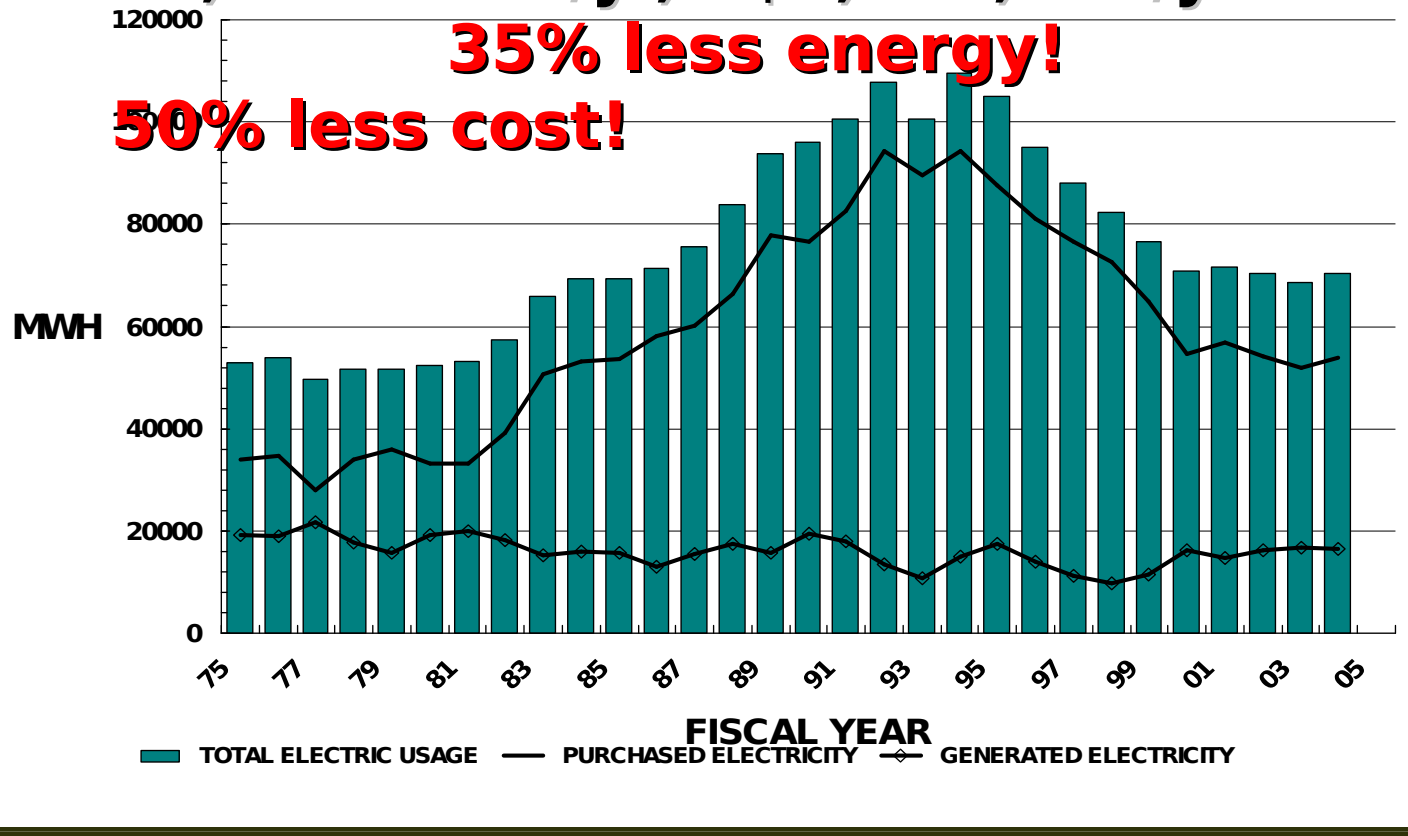
RIA ENERGY PROGRAM
FY 2005 ELECTRIC TRENDS

FY 1992: 107,840 MWH/yr, $4,490,787/yr

FY 2004: 70,344 MWH/yr, $2,252,799/yr

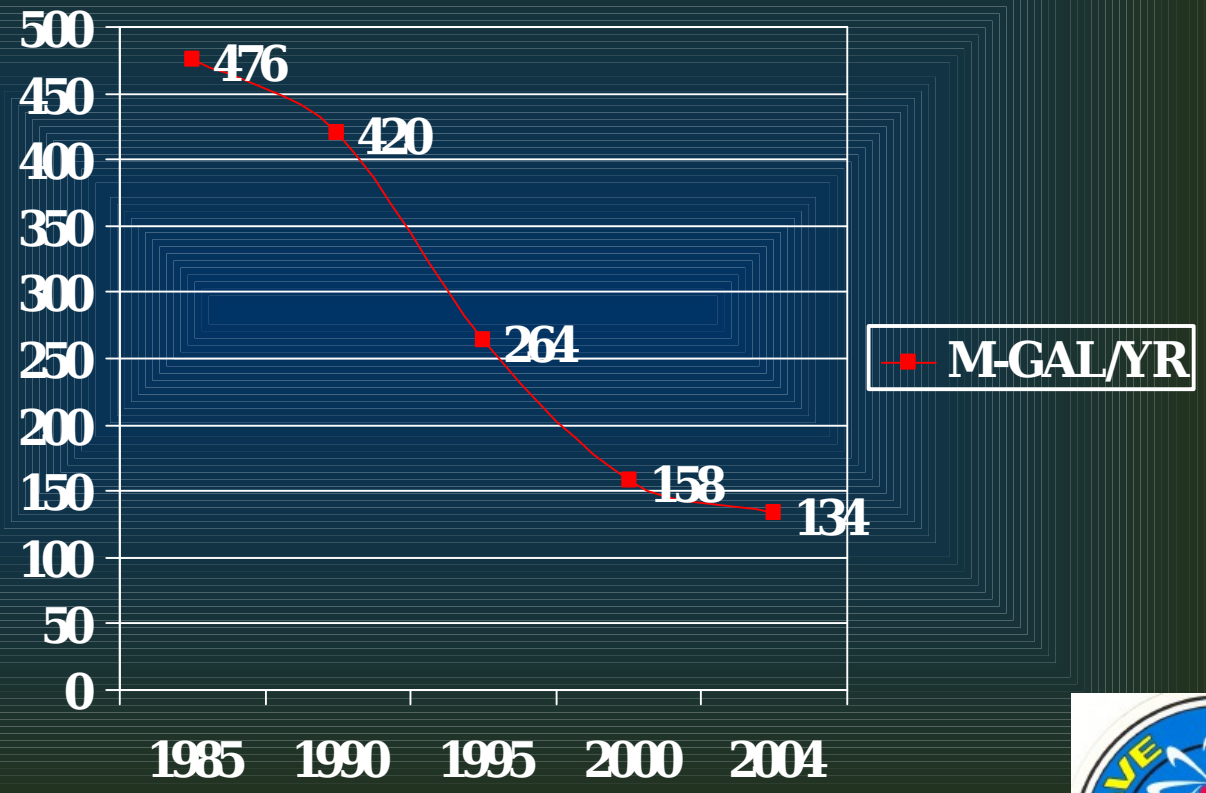
35% less energy!

50% less cost!



RIA ENERGY PROGRAM

FY 2005 WATER CONSERVATION PROGRESS CHART

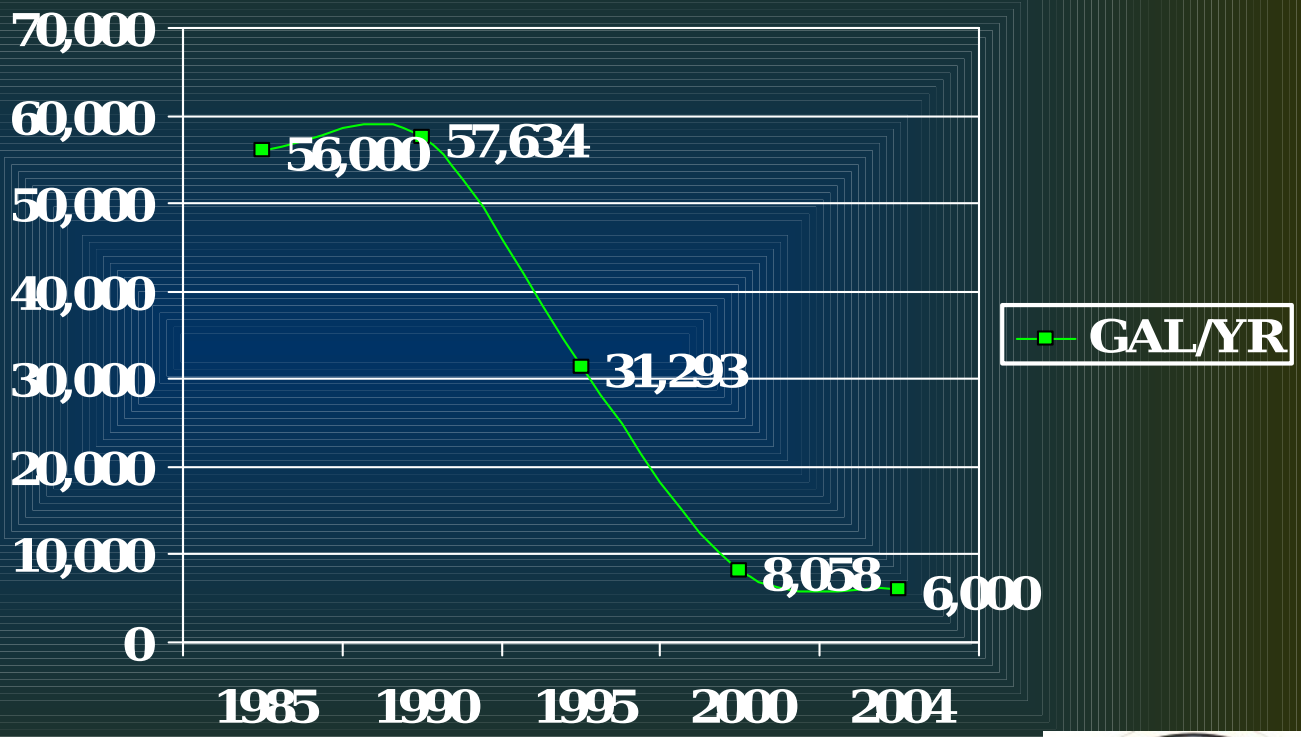


A 72 % reduction in water use!

- **Mostly by eliminating leaks and one-pass cooling**

RIA ENERGY PROGRAM

FY 2005 PETROLEUM FUELS PROGRESS CHART



88 % Reduction in Petroleum Use

- **Manufacturing Consolidation**

ENERGY PROGRAM OBJECTIVES

RIA ENERGY PROGRAM
FOUR PRINCIPLE OBJECTIVES

- REDUCE PRICE OF PURCHASED ENERGY
- REDUCE LOAD OR NEED
- REDUCE EQUIPMENT OPERATING HOURS
- IMPROVE OPERATING EFFICIENCY

RIA ENERGY PROGRAM
REDUCE PRICE OF ENERGY

- PURCHASE UTILITIES COMPETETIVELY
- AVOID PEAK DEMAND CHARGES
  Use peak shaver, shift process loads.
- USE CHEAPEST FUELS
- MAINTAIN ACCOUNTING SYSTEM

RIA ENERGY PROGRAM
REDUCE LOAD OR NEED

- CONSOLIDATE BUILDING SPACE
- ENERGY EFFICIENT ENVELOPES
- REDUCE OVERHEATING & OVERCOOLING
- ELIMINATE LEAKS
  - especially steam, air, &

RIA ENERGY PROGRAM

REDUCE EQUIPMENT OPERATING HOURS

- EXPAND DDC HVAC CONTROL SYSTEMS AND MAINTAIN NIGHT SETBACKS
- OPERATE LIGHTING ONLY WHEN NEEDED
- USE OCCUPANCY SENSORS

RIA ENERGY PROGRAM
IMPROVE OPERATING EFFICIENCY

- IMPROVE HEATING PLANT EFFICIENCY
- RE-COMMISSION HVAC
- INSTALL HIGH EFFICIENCY CHILLERS
- HIGH EFFICIENCY MOTORS & VFDs
- ENERGY EFFICIENT LIGHTS

ENERGY PROGRAM SUCCESSES

RIA ENERGY PROGRAM

HQ FUNDED PROJECTS

	YEAR	PROJECT COST	SAVINGS/YR
• NAT. GAS TO V AREA	94	$ 170K	
		(FEMP)	$ 30K
• EXPAND EMCS SYST.	94	$ 180K	
		(FEMP)	$150K
• WAREHOUSE LIGHTS	94	$ 300K	
		(FEMP)	$ 90K
• EXIT SIGN LAMPS	94	$ 15K (FEMP)	
			$ 7K
• HYDROPLANT MOD	95	$3,000K	
		(ECIP)	$500K
• HYDRO TURBINES (4)	95	$2,500K	

RIA ENERGY PROGRAM

HQ FUNDED PROJECTS

	YEAR	PROJECT COST	SAVINGS/YR
• TEMP. CONTROLS	95	$ 458K (FEMP)	$ 90K
• HYDRO TURBINES (4)	97	$2,500K (ECIP)	$500K
• REPAIR STEAM TRAPS	97	$ 712K (FEMP)	$300K
• REPLACE CHILLERS	2005	$5,500K (ECIP)	$825K
• TOTALS		$17,210K	$3,167K

RIA ENERGY PROGRAM

LIGHTING PROJECT STATISTICS

	COST	# FIXTURES	OLD KW	NEW KW
BLDG 299	$300k	1,100	459	145
BLDG 350	$820k	5,000	800	334
BLDG 220	$864k	3,100	891	273
ESPC - LITES	$5,106	25,185	4,078	1,904
TOTALS	$7,090k	34,385		2,656

Doesn't include Arsenal Funded Projects
- Bldgs 60, 62, 68, 131, 390

RIA ENERGY PROGRAM

RIA FUNDED PROJECTS (RECENT)

- LIGHTING, BLDG 390, BLDG 68 (FY 99)
- LIGHTING, ELECTRIC SERVICE, 62 (FY 01)
- LIGHTING, BLDG 60 (FY 04)
- HVAC CONTROLS, 210, 211, 212E (FY 03) (UMCS)
- HVAC CONTROLS, 208, 212W, (FY 03) (JOC)
- HVAC CONTROLS, Bldgs 102-110 (04)
- HVAC VFD's, 102-110, (FY 04)

RIA ENERGY PROGRAM

RIA FUNDED PROJECTS (RECENT)

- WATER SYSTEM VFD'S, 9, 52, (FY 03-04) (3 high service pumps)
- STEAM TRAP REPLACEMENTS (FY 04) (Bldgs 350, 390, 60-68, 56, 90, REARM, 131, 159)
- BUILDING 131 RENOVATION (FY 04) (includes new windows & lighting)

RIA ENERGY PROGRAM

RIA O&M CONTRACTS (BASE OPERATIONS)

- REQUIRES MINIMUM OF 70 % CONDENSATE RETURN
- HIGH PRESSURE STEAM AND CONDENSATE LINES INSPECTED SEMI-ANNUAL
- HIGH PRESSURE TRAPS INSPECTED QUARTERLY
- LOW PRESSURE TRAPS – ONE QUADRANT INSPECTED ANNUALLY
- CLEANING CREWS TURN OFF LIGHTS

RIA ENERGY PROGRAM

RIA O&M CONTRACTS (BASE OPERATIONS)

- A MASSIVE TRAP INVENTORY AND REPLACEMENT EFFORT IS IN PROCESS THIS YEAR
- HVAC CONTRACTORS MEET WEEKLY TO DISCUSS SYSTEM MANAGEMENT
- WATER HEATERS BEING CONVERTED TO ELECTRIC TO ALLOW SUMMER SHUT DOWN OF MAINS

RIA ENERGY PROGRAM
- FAMILY HOUSING PROJECTS

- NEW ENERGY EFFICIENT DOORS AND WINDOWS WERE INSTALLED IN QTRS 99 - 100
- ADDITIONAL ATTIC INSULATION WAS BLOWN IN TO QTRS 99 - 100
- PATIO PAVERS WERE INSTALLED TO REDUCE LANDSCAPE MAINTENANCE
- NEW CHILD CARE CENTER – INCLUDES “SUSTAINABLE DESIGN” PRACTICES

RIA ENERGY PROGRAM

5 ESPC PROJECTS (PR 1999-3066)

DEAM36-02-C-4500-A00001

- **GEOTHERMAL IN HOUSING** (PR 2002-6206)
- **LIGHTING CONVERSIONS** (PR 2002-6207)
- **HVAC CONTROLS** (PR 2002-6208)
- **HYDRO-ELECTRIC TURBINES** (PR 2002-6209)
- **PEAK GENERATOR** (PR 2002-6210)

ESPC DEFINITION:
ENERGY SAVING PERFORMANCE CONTRACT

- A MECHANISM TO CREATE PARTNERSHIPS TO FINANCE AND IMPLEMENT ENERGY PROJECTS
- THE PRIME CONTRACTOR CARRIES THE CONTRACTING RISK
- THE ARSENAL'S ONLY UP-FRONT COSTS ARE FOR PROCUREMENT AND ADMINISTRATION
- ESPC's MAY INVOLVE THIRD PARTY FINANCING
- PROJECTS ARE PAID FOR OVER AN AGREED UPON TERM WITH ENERGY AND O&M SAVINGS

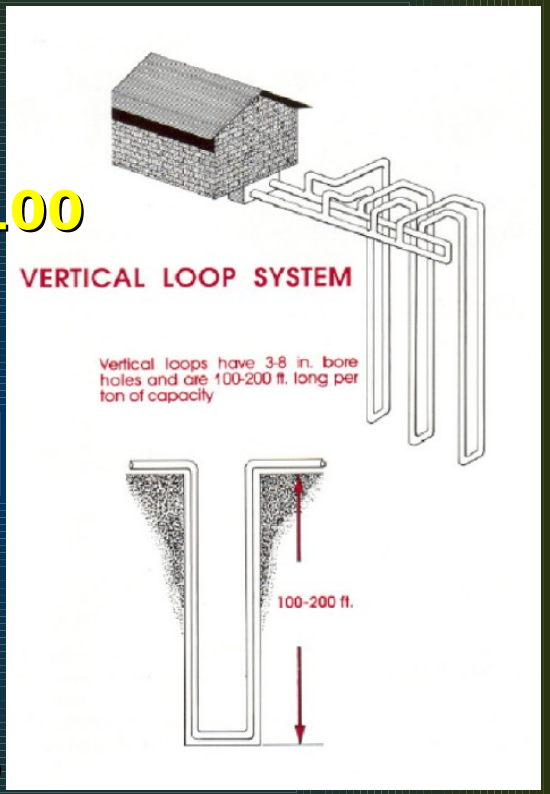
RIA ENERGY PROGRAM
CURRENT ESPC COST SUMMARY

ITEM	COST ($k)	SAVINGS ($K)
GEOTHERMAL	$ 352	$ 17.4
LIGHTING	$ 5,106	$ 402.2
HVAC CONTROLS	$ 417	$ 86.5
HYDRO-ELECTRIC	$ 2,836	$ 155.1
PEAK SHAVER	$ 1,083	$ 27.1
TOTALS:	**$ 9,794**	**$ 688.2**

Note: COST ($k) includes the cost of financing
Construction Cost was ~ $8,250k

RIA ENERGY PROGRAM

ESPC: GEOTHERMAL IN HOUSING



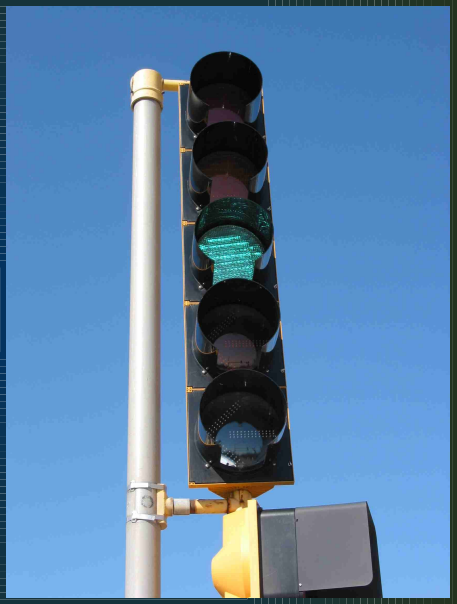
- AFFECTS BUILDINGS 92 THRU 100
- 40 FAMILY HOUSING UNITS
- CLOSED LOOP SYSTEMS
- 2 WELLS PER APARTMENT
- 4 INCH BORE HOLE, 200 FEET DEEP
- GROUND-SOURCE HEAT PUMPS REPL RNAC A/Cs

RIA ENERGY PROGRAM
ESPC: LIGHTING ACTIONS

- AFFECTS 63 BUILDINGS
- +24,000 LIGHT FIXTURES CONVERTED
- STANDARDIZED ALL HIGH INTENSITY DISCHARGE FIXTURES IN MFG.
- STANDARDIZED T-8 FLUORESCENT THROUGHOUT ADMIN SPACE
- OCCUPANCY SENSORS INSTALLED IN RESTROOMS AND SMALL AREAS

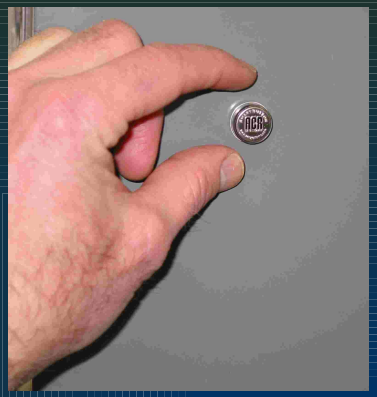
RIA ENERGY PROGRAM
ESPC: LIGHTING ACTIONS

- INSTALLED LIGHT EMITTING DIODE TRAFFIC LIGHTS & EXIT SIGNS



RIA ENERGY PROGRAM

ESPC: HVAC CONTROLS



- PHASE III OF REARM AREA
- BUILDINGS 220, 222, 230
- INSTALLS DIRECT DIGITAL CONTROLS
- AFFECTS 21 EXHAUST FANS, 26 HEATING AND VENTILATING UNITS, & FIVE MISC. UNITS
- TEMPERATURE DATA-LOGGERS USED TO VERIFY BUILDING

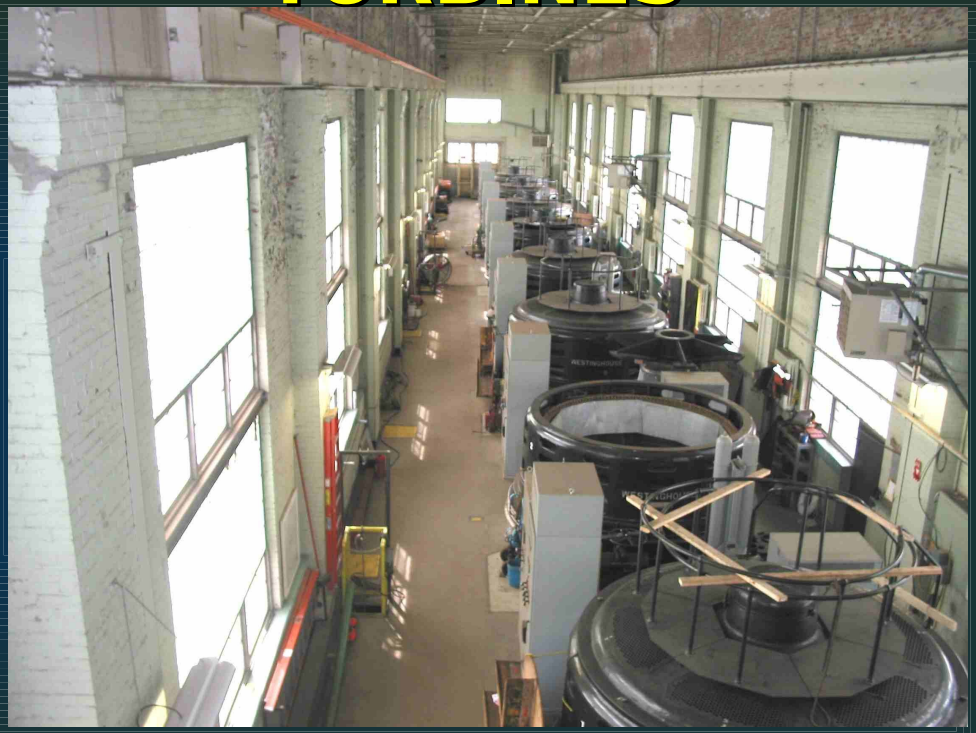
RIA ENERGY PROGRAM

ESPC: HYDRO-ELECTRIC TURBINES

- RENOVATES UNITS 2, 5, & 9
- RESULTS IN ADDITIONAL 700 KW OF POWER
- REPLACES DETERIORATED RUNNERS WITH STAINLESS STEEL, RECONDITIONS OTHER MECHANICAL COMPONENTS

RIA ENERGY PROGRAM

ESPC: HYDRO-ELECTRIC TURBINES



- 8 MAIN GENERATORS
- 2 SMALLER GENERATORS

2.3 mega-Watt average output

20,000 – 22,000 MWH/year generation

RIA ENERGY PROGRAM

ESPC: PEAK SHAVER

- 1000 KILO-WATT STANDBY GENERATOR
- DIESEL ENGINE
- 200 HRS PER YEAR ANTICIPATED
- 3000 GALLON BASE MOUNTED TANK

RIA ENERGY PROGRAM
INDUSTRIAL ACCOMPLISHMENTS

- REARM – MAJOR INDUSTRIAL RENOVATION COMPLETED IN 1990’S
  - BUILDING CONSOLIDATION
  - HEATING PLANT RENOVATION
  - AUTOMATED STORAGE
  - STATE OF ART MFG TECHNOLOGIES
  - ENERGY EFFICIENT STRUCTURI
  - LESS USE OF MOBILITY FUELS

RIA ENERGY PROGRAM
INDUSTRIAL ACCOMPLISHMENTS

- SHORT CYCLE HEAT TREAT STUDY
- ENERGY EFFICIENT MOTORS EMPHASIZED IN MAINTENANCE
- CONVERSION OF FORGES FROM STEAM TO PNUEMATIC DRIVES
- HIGH SPEED OVERHEAD DOOR INSTALLED WHERE PRACTICAL

Manufacturing Renovation Early 1990's

WELDING

FOUNDRY

FORGING

MACHINING

CASTINGS

Rock Island Arsenal
Kingsbury
Manufacturing
Complex

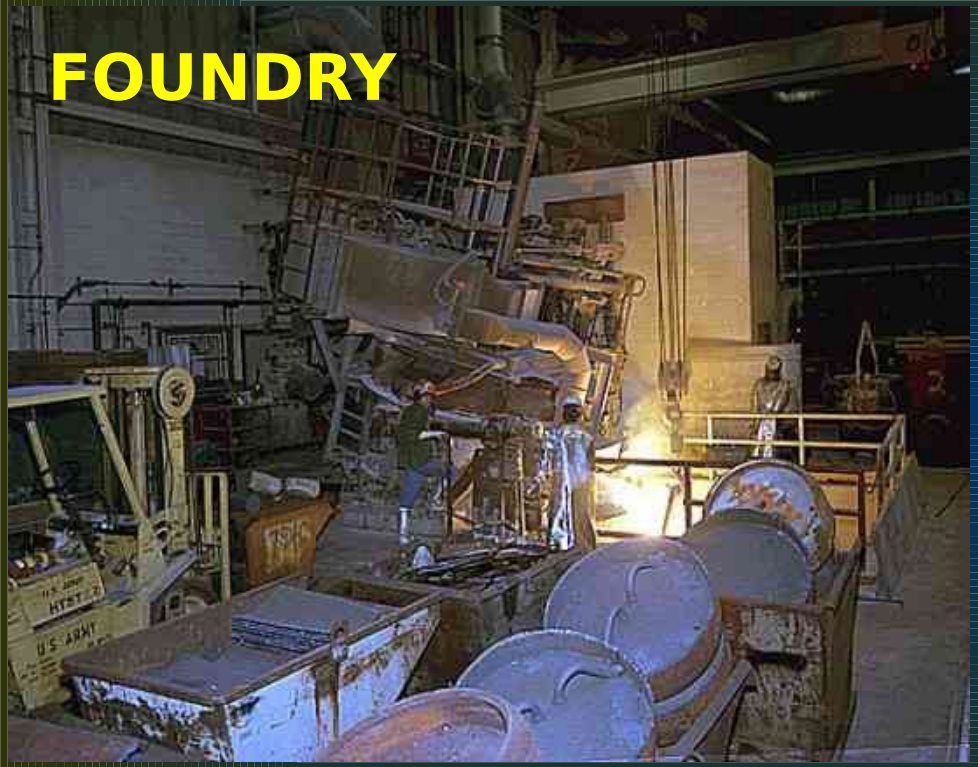
SIMULATIO
N

INSPECTION

LARGE
ASSEMBLY

ASSEMBLY
CLIMATE
CONTROLLE
D

Manufacturing Capabilities



Electric Furnaces provide better control and use less energy than gas furnaces

The forges were converted from steam to pnuematic drives

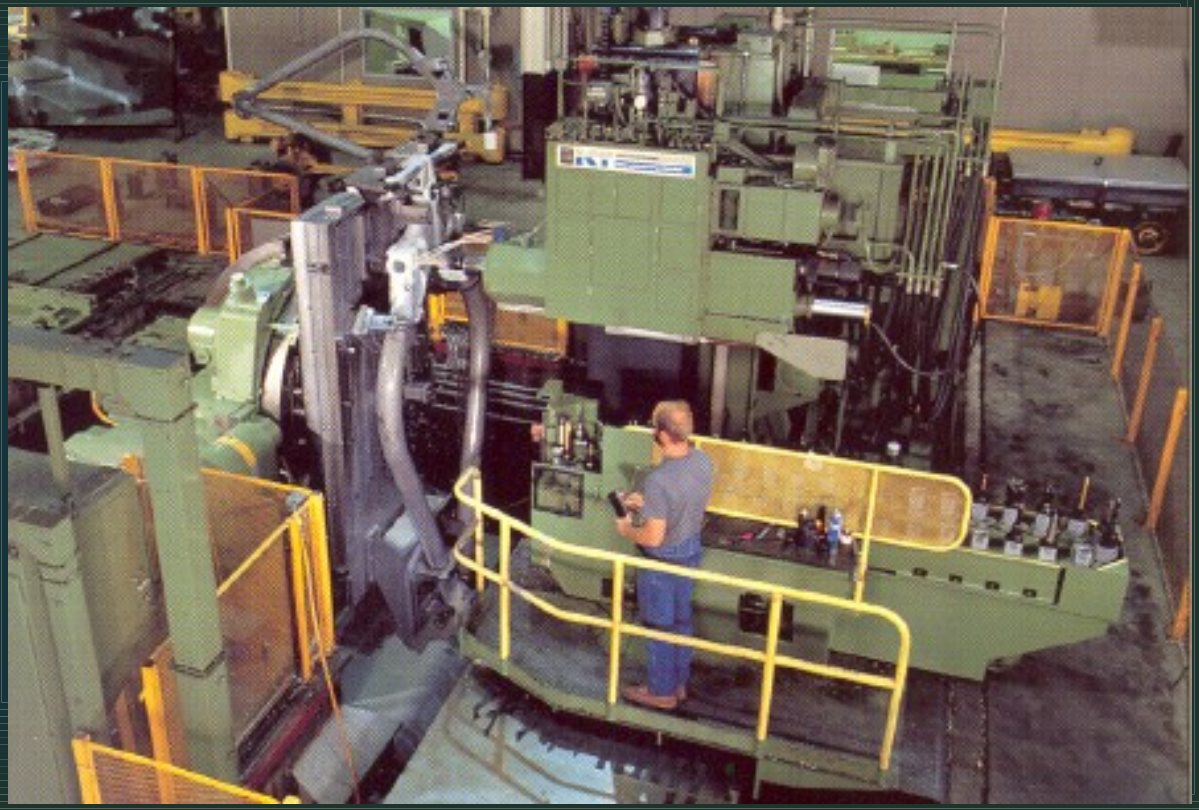
Manufacturing Capabilities

A state-of-art welding center was established

Manufacturing Capabilities

- 4-Axis Machining Centers
  -
  Save energy through work space consolidation

Manufacturing Capabilities



7-Axis Machining Centers

- We have one of the most capable machining centers in the world

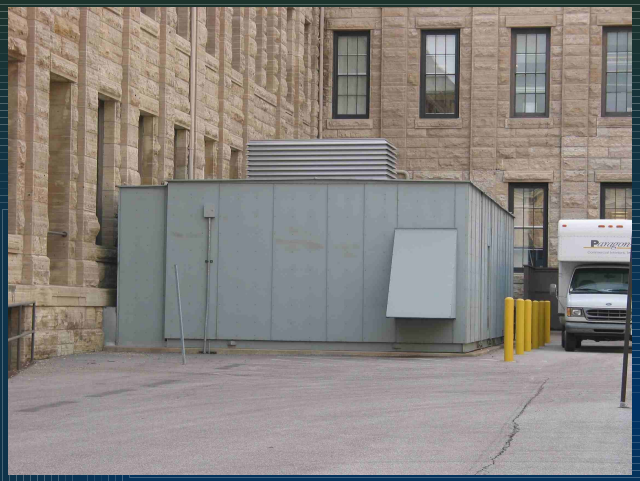
ENERGY PROJECT OPPORTUNITIES

RIA ENERGY PROGRAM
PROJECT OPPORTUNITES (FUTURE)

- HVAC & CHILLER PLANTS
- HEATING PLANT & STEAM SYSTEM
- INDUSTRIAL PROCESS IMPROVEMENTS
- LIGHTING & ELECTRICAL
- BUILDING ENVELOPE
- WATER SYSTEM

RIA ENERGY PROGRAM

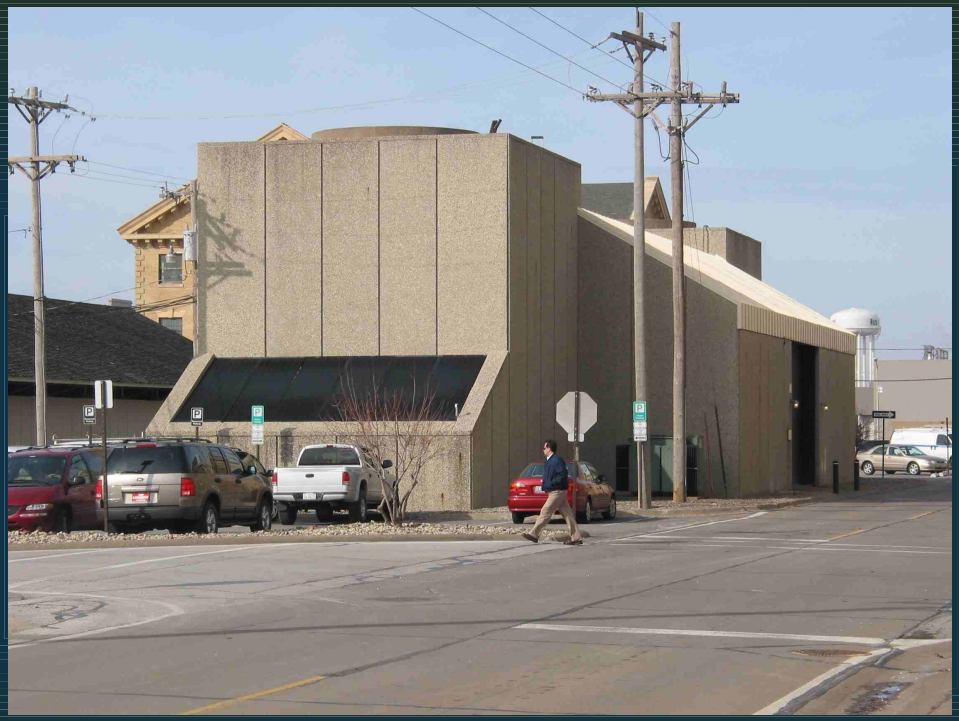
CHILLER PROJECTS – ECIP



- **CHILLER REPLACEMENTS, PR 2004-0730** **FY 2005 ECIP (FUNDED)**
  - **2375 TONS COOLING**
  - **BLDG 348 PLANT**
  - **BLDG 73 PLANT**
  - **ALSO STEAM MAIN**

RIA ENERGY PROGRAM

CHILLER PROJECTS – ECIP



- **CHILLER REPLACEMENTS, FY 2005 ECIP (FUNDED)**
  - **BLDG 114 PLANT, 940 TONS COOLIN**
  - **PACKAGE BOILER (HEAT PLANT SHUT-DO**

RIA ENERGY PROGRAM
CENTRAL HEATING PLANT

- ENERGY SAVING OPPORTUNITIES
  - REPLACE COAL HANDLING $2500k
  - STEAM MAIN MODIFICATIONS $1200k
  - THERMAL ICE STORAGE $2550k
  - PERIMETER HEAT CONVERSIONS $1500k
  - VARIABLE FREQ. DRIVES $170k
  - ONE-PASS BEARING WATER

RIA ENERGY PROGRAM
INDUSTRIAL OPPORTUNITIES
"SHOWCASE PROGRAM"

- MANUFACTURING VENTILATION
  - PLATING SHOP TANKS
  - MACHINERY MIST CONTAINMENT
  - HEAT TREAT FUME EVACUATION
- PAINT BOOTH CONTAINMENT AND LOW TEMPERATURE HEAT RECOVERY
- BUILDING ENVELOPE IMPROVEMENTS
- EFFICIENT SPACE UTILITIZATION
- WATER CONSERVATION?

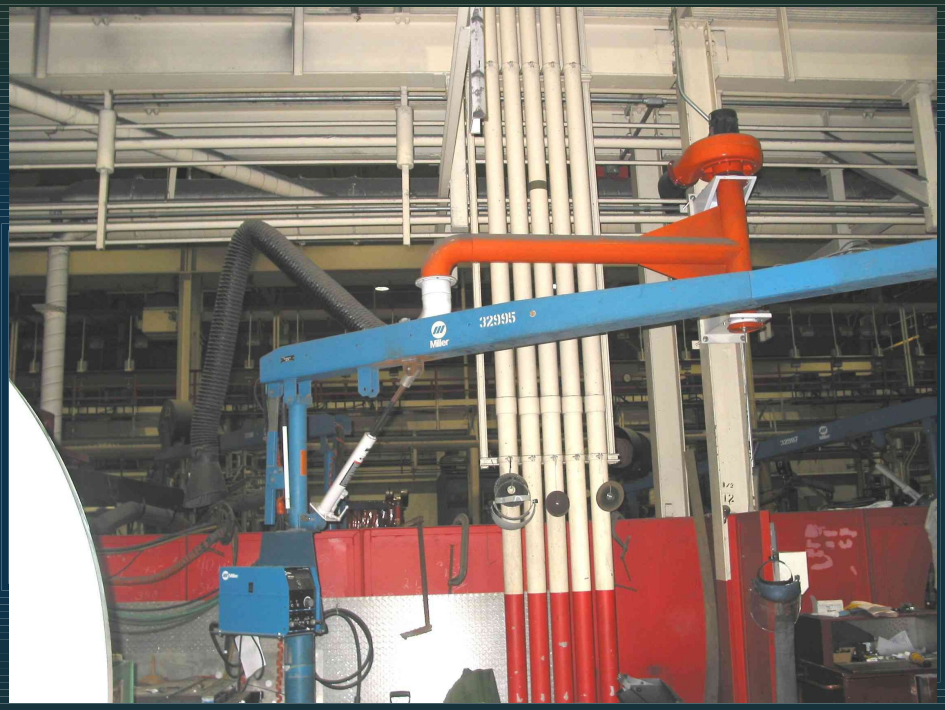
RIA ENERGY PROGRAM
INDUSTRIAL OPPORTUNITIES

- COVER PLATING SHOP TANKS
  - MIST CONTAINMENT
  - MINIMIZE WATER

RIA ENERGY PROGRAM
INDUSTRIAL OPPORTUNITIES

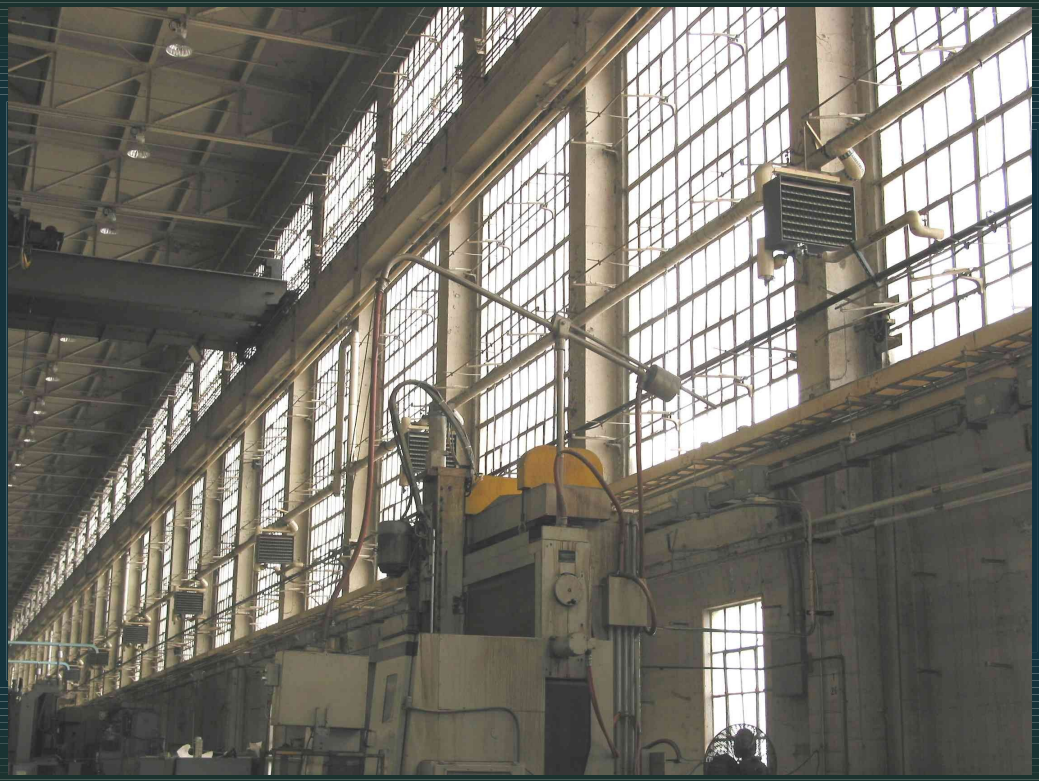
- PAINT BOOTH CONTAINMENT & HEAT LOW-TEMP HEAT RECOVERY

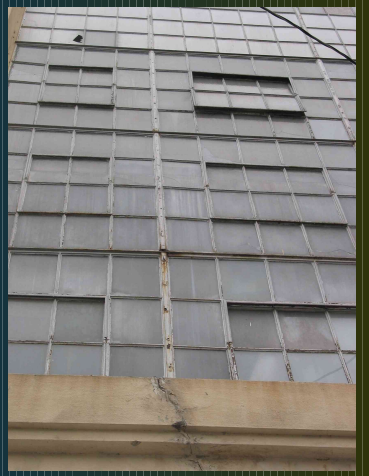
RIA ENERGY PROGRAM
INDUSTRIAL OPPORTUNITIES



- SHUT-OFF DEVICE OR CONTROL FOR VENTILATION PICK-UPS

RIA ENERGY PROGRAM
INDUSTRIAL OPPORTUNITIES

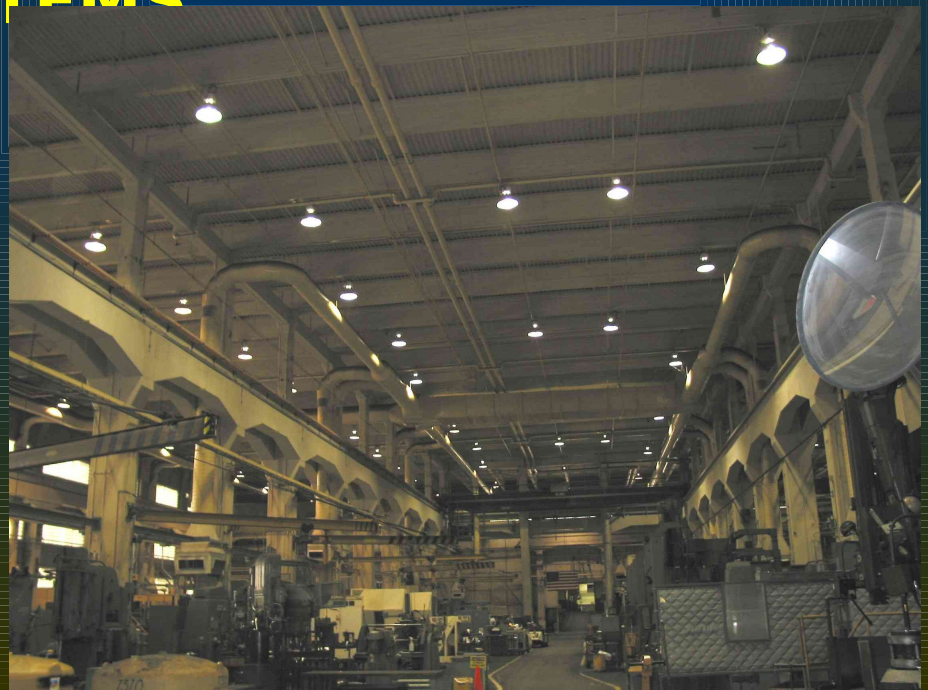




- **BUILDING 220 - ENVELOPE IMPROVEMENTS**

RIA ENERGY PROGRAM
ELECTRICAL OPPORTUNITIES

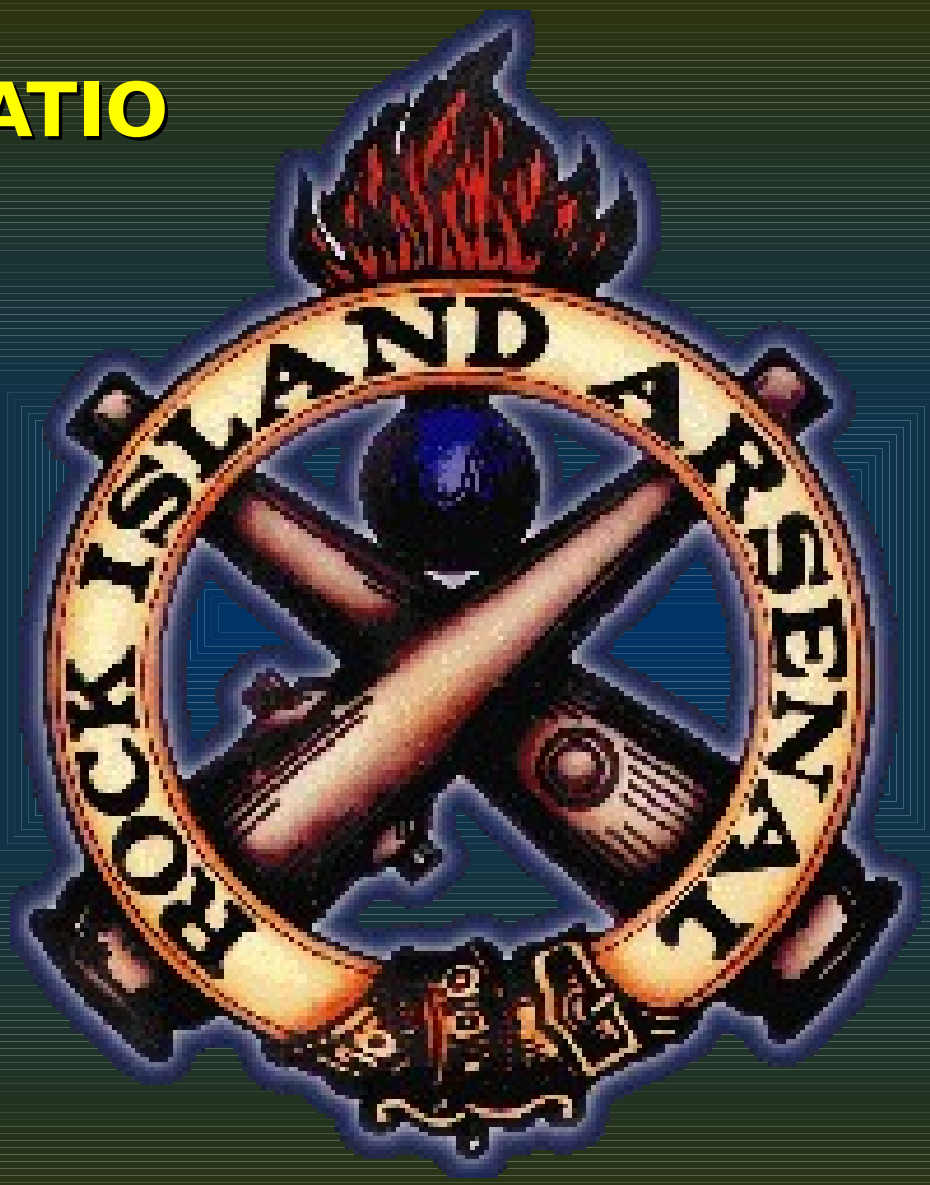
- ELIMINATE NIGHT LIGHTING WASTE THROUGH SWITCHING IMPROVEMENTS AND DEDICATED NIGHT LIGHTS
- MORE VFD MOTORS FOR HVAC SYSTEMS



RIA ENERGY PROGRAM
OTHER LONG-TERM INITIATIVES

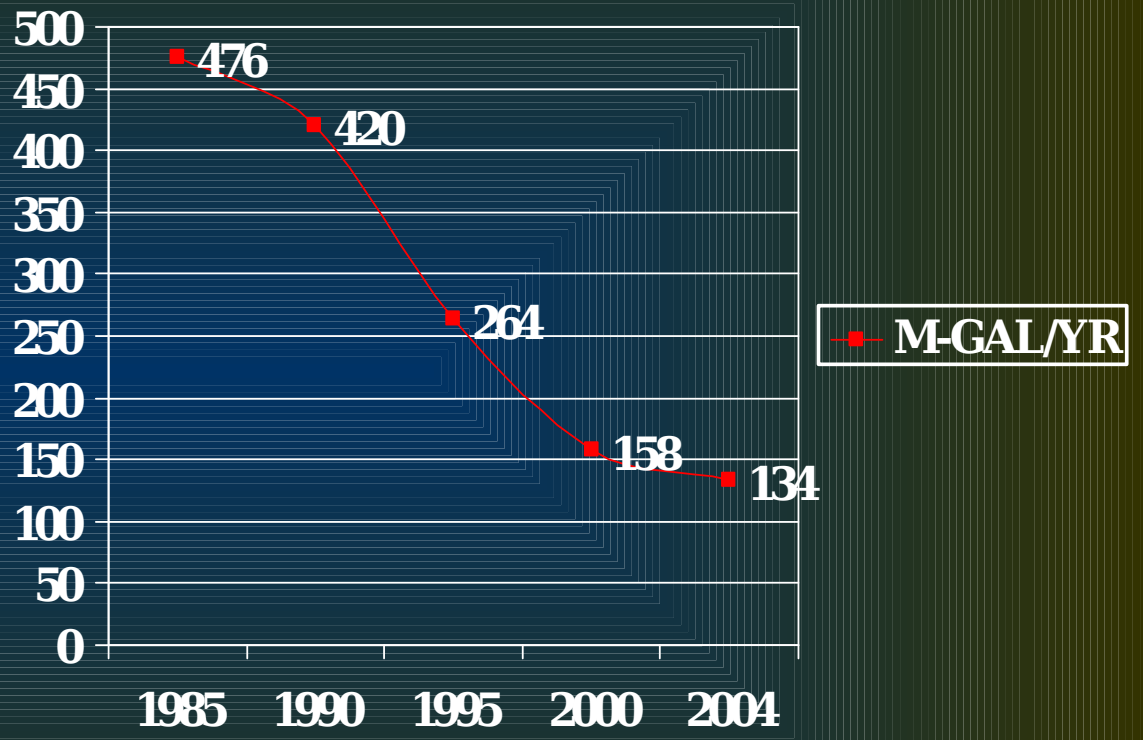
- MODERNIZE OR REPLACE HEATING PLANT (DETERMINE BEST OPTION)
- INSULATE ADMIN BUILDINGS (A HISTORICAL CHALLENGE?)
- CONTINUE INSTALLING ENERGY EFFICIENT WINDOWS THRU FORCE PROTECTION & REMODELLING
- CONDUCT A GEOTHERMAL TEST SITE FOR CRITICAL ADMIN BLDGS?

WATER CONSERVATION PLAN



RIA ENERGY PROGRAM
WATER CONSERVATION PLAN

A 72 % reduction in water use!



- **Our Success Is Based On Application of Ten Best Management Practices (BMPs)**

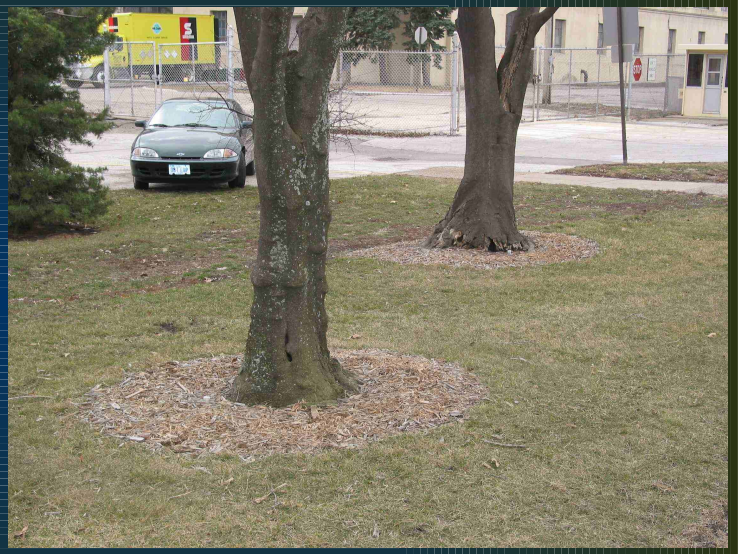
RIA ENERGY PROGRAM
WATER CONSERVATION PLAN
1. INFO & EDUCATION

- RIA PUBLIC AWARENESS MESSAGES SENT SEMI-ANNUALLY
- WATER CONSERVATION MEASURES ARE ALSO INCLUDED IN GENERAL ENERGY AWARENESS MESSAGES
- OUR WATER CONSERVATION PRACTICES WILL BE CONVEYED TO OTHER SITES THROUGH THE DA AWARENESS PROGRAMS AND ENGINEERING SOCIETY BRIEFINGS

RIA ENERGY PROGRAM
WATER CONSERVATION PLAN
2. SYSTEM AUDITS

- ULTRASONIC LEAK MONITORING IS CONDUCTED ANNUALLY
- WASTEWATER FLOW PHYSICALLY IS MONITORED QUARTERLY
- WATER PLANT FLOW IS MONITORED MONTHLY

RIA ENERGY PROGRAM
WATER CONSERVATION PLAN
3. WATER EFFICIENT LANDSCAPE



- A HIGH DENSITY OF TREES IS MAINTAINED WHICH REDUCES WATERING
- "XERISCAPE" LANDSCAPING IS EMPLOYED

RIA ENERGY PROGRAM
WATER CONSERVATION PLAN
3. LANDSCAPE (cont.)

- SIGNIFICANT AREAS HAVE BEEN RETURNED TO NATURAL PRAIRIE

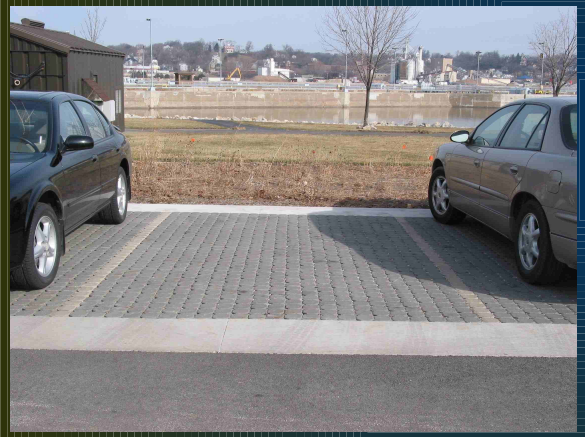
RIA ENERGY PROGRAM
WATER CONSERVATION PLAN
3. LANDSCAPE (cont.)

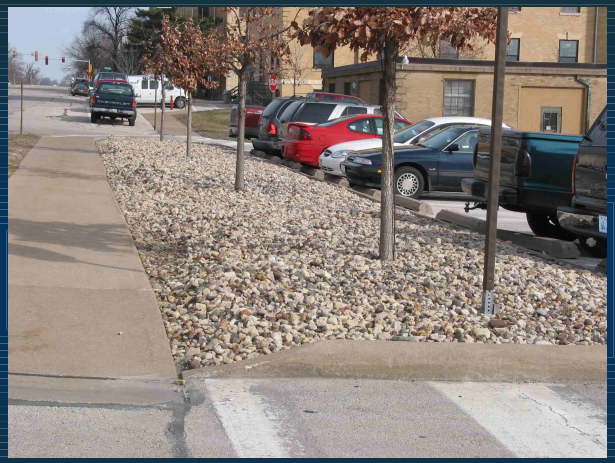
- MORE NATURAL PRAIRIE WITH MINIMAL MAINTENANCE

RIA ENERGY PROGRAM
WATER CONSERVATION PLAN
3. LANDSCAPE (cont.)

- USE OF RESILIANT PRAIRIE GRASS EAST OF THE PROVING GROUNDS

RIA ENERGY PROGRAM
WATER CONSERVATION PLAN
3. LANDSCAPE (cont.)





- ROCK MULCH AND PERMEABLE PAVERS ARE USED FOR RAINWATER RETENTION
- THE GOLF COURSE USES POND WATER

RIA ENERGY PROGRAM

WATER CONSERVATION PLAN

5. FAUCETS & SHOWERHEADS

- ONLY LOW FLOW DEVICES HAVE BEEN MADE AVAILABLE TO HOUSING THRU SELF HELP FOR MANY YEARS
- ALL REPAIR AND RENOVATION PROJECTS EMPLOY LOW FLOW TECHNOLOGIES
- ALL FAUCETS TO BE INSPECTED FOR LOW FLOW AERATORS
- NOTE: BMP 4. WATERLESS URINALS WERE NOT COST EFFECTIVE SINCE WE ALREADY HAV 1.0 GPF URINALS

RIA ENERGY PROGRAM
WATER CONSERVATION PLAN
6. BOILER/STEAM SYSTEMS

- BY CONTRACT, BASE OPERATIONS MUST MAINTAIN 70% CONDENSATE RETURN (PENALTY CLAUSE)
- STEAM TRAP REPAIRS ON ANNUAL ROTATION – ¼ OF SYSTEM EACH YEAR
- HIGH PRESSURE TRAPS ARE INSPECTED QUARTERLY
- CONDENSATE RETURN SYSTEMS A INSPECTED SEASONALY
- BEARING WATER PROJECT

RIA ENERGY PROGRAM
WATER CONSERVATION PLAN
7. SINGLE-PASS COOLING SYSTEMS

- ONE-PASS COOLING HAS BEEN NEARLY ELIMINATED OVER PAST 10 YEARS
- STARTED WITH A FOUNDRY PROJECT
- THEN A COMPRESSOR PLANT PROJECT
- FUTURE ACTIONS:
  - REVIEW HEAT PLANT COOLING AND DO A BEARING WATER PROJ
  - REVIEW CAFETERIA COOLING

RIA ENERGY PROGRAM
WATER CONSERVATION PLAN
8. COOLING TOWER MANAGEMENT

- REQUIREMENTS CLEARLY DEFINED AND MONITORED THROUGH BASE-OPS CONTRACT
- CONTRACT REQUIRES REGULAR INSPECTIONS AND MAINTENANCE TO MINIMIZE ONE-PASS COOLING

RIA ENERGY PROGRAM
WATER CONSERVATION PLAN
9. HIGH USING PROCESS

- THE PLATING SHOP IS A VERY HIGH WATER USE INDUSTRIAL FACILITY THAT WILL BE STUDIED THIS YEAR
- WATER SAVINGS WILL BE INCORPORATED INTO A PROJECT TO COVER PLATING TANKS IF IT IS DETERMINED TO BE ECONOMICAL
- NO OTHER OPPORTUNITIES IDENTIFIED AT THIS TIME

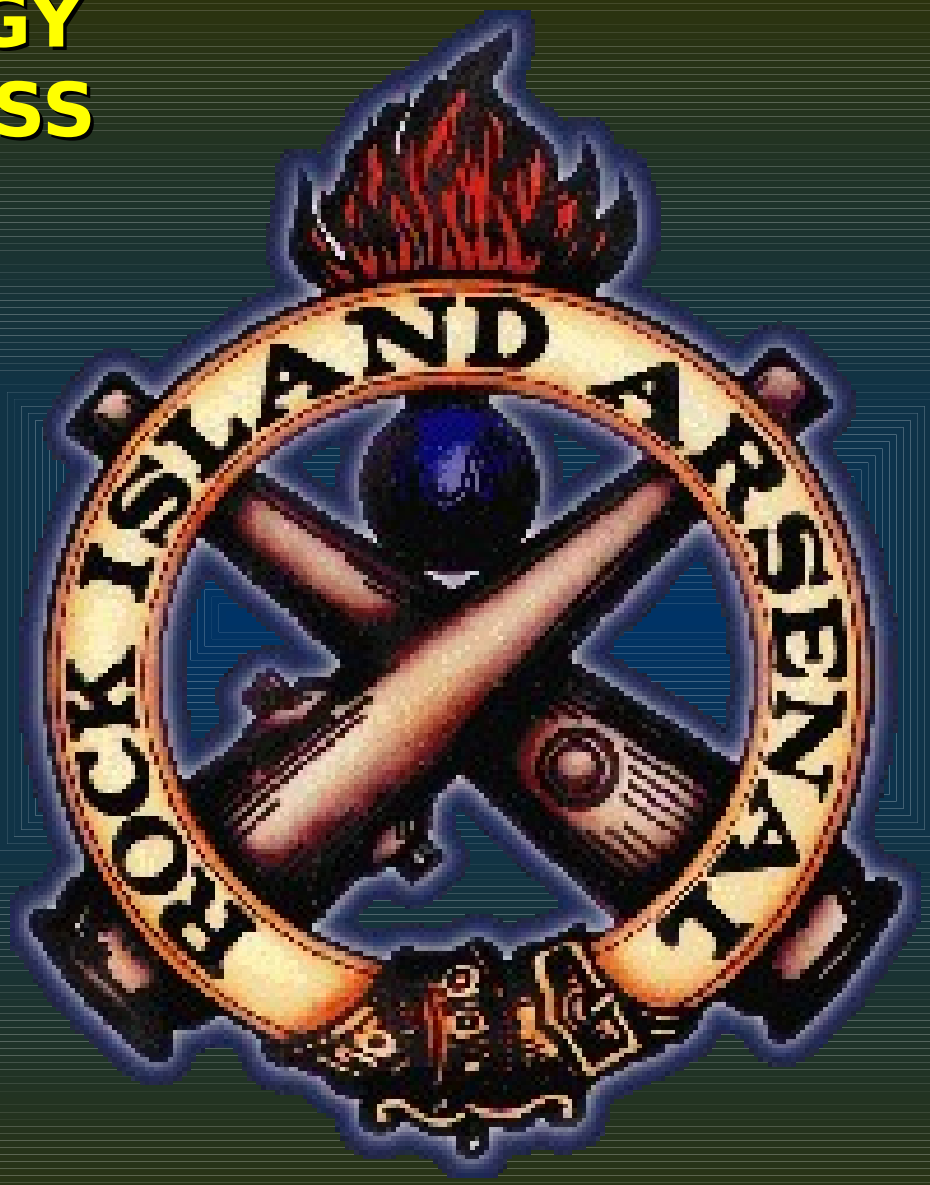
RIA ENERGY PROGRAM

WATER CONSERVATION PLAN

10. REUSE AND RECYCLING

- OUR NEW CAR WASH AT BUILDING 351 EMPLOYED A STATE OF ART WATER REUSE AND RECYCLING SYSTEM

RIA ENERGY AWARENESS PLAN



RIA ENERGY PROGRAM
ENERGY AWARENESS PLAN

- COMMAND EMPHASIS
  - COMMANDER POLICY STATEMENT
  - ARSENAL ENERGY POLICY – RIAR 11-1
  - BRIEFINGS & WALKTHROUGHS
  - ENERGY AWARDS PARTICIPATION
- TRAINED FULL-TIME ENERGY COORDINATOR
  - CERTIFIED ENERGY MANAGERS (CEM)

RIA ENERGY PROGRAM
ENERGY AWARENESS PLAN

- ENERGY AWARENESS MESSAGES IN RIA NEWSPAPER
- ENERGY AWARENESS PROMOTED IN GENERAL EMAIL ROUTINGS
- PUBIC AWARENESS THROUGH BRIEFINGS AND TOURS
- COMPUTER USE - AWARENESS MESSAGE

RIA ENERGY PROGRAM

OTHER PROGRAMS

- SUCCESSFUL RECYCLING PROGRAM MAINTAINED OUT OF BUILDING 106.
- RECYCLING AWARENESS MESSAGES REGULARLY SENT
- CARPOOL MAINTAINED

RIA ENERGY PLANS & POLICIES

RIA ENERGY PROGRAM

PLANS AND POLICIES

- ARMY ENERGY PROGRAM, AR 11-27
- COMMANDER'S POLICY MEMO, #A-01
- RIA ENERGY PROGRAM, RIAR 11-1
- ENERGY RESOURCE MANAGEMENT PLAN
- WATER MANAGEMENT PLAN
- ENERGY SECURITY PLAN
- ENERGY SHEDDING CONTINGENCY

THANK YOU
FOR YOUR SUPPORT!
ROCK ISLAND ARSENAL